ELECTRONIC SOLUTIONS

KOSTAL

Operating manual

KOSTAL POWER SUPPLY

EN

Contents

1. About this document

1.1 Information about this operating manual

The operating manual describes the KOSTAL power supply units:

- KPS 24V
- KPS 48V

The term "power supply unit" is used in the singular in the text in this manual. The information in this operating manual refers to both variants (unless otherwise stated).

The operating manual forms part of the product and contains important instructions and information about the various operating phases of the power supply unit. It describes the power supply unit at the time of delivery by KOSTAL.

The current version of this operating manual can be found online at:
www.kostal-electronic-solutions.com

All details and information in this operating manual have been compiled taking into account the applicable standards and regulations as well as the state of the art.

⇨ To ensure trouble-free and safe operation and to fulfil any warranty claims, first read the operating manual and follow the instructions.

⇨ Keep the operating manual close to the power supply unit.

⇨ Pass the operating manual on to any subsequent owner or user.

The manufacturer accepts no liability for damage or malfunctions resulting from failure to comply with this operating manual.

If you still have questions after reading the operating manual, please contact KOSTAL customer service. You will find your local contacts online at www.kostal-electronic-solutions.com.

1.2 Warnings in this document

Warnings are provided in the context in which a hazard to which the warning refers may occur. They are structured as follows:

SIGNAL WORD

Nature and source of hazard

Consequence/consequences of non-compliance

⇨ Action/actions to avoid the hazard

Signal words indicate the type and severity of the consequences of not taking actions to avoid hazards.

DANGER

Indicates a direct hazard with a high level of risk

If it is not prevented, it will result in death or serious injury.

⇨ Action/actions for prevention

WARNING

Indicates a hazard with a medium level of risk

If it is not prevented, it may result in death or serious injury.

⇨ Action/actions for prevention

CAUTION

Indicates a hazard with a low level of risk

If it is not prevented, it will result in minor or moderate injury.

⇨ Action/actions for prevention

NOTE

Indicates a hazard with a low level of risk

If it is not prevented, it may result in damage to property.

⇨ Action/actions for prevention

1.3 Symbols

This symbol indicates useful and important information.

☑ This symbol represents a requirement that must be met before installation or maintenance work is carried out.

This symbol represents general safety-related information.

This symbol warns of hot surfaces.

⇨ This symbol represents an action to be carried out.

■ This symbol represents lists.

2. Safety-related information

2.1 State of the art

KOSTAL power supply units are built taking account of the applicable standards and state of the art and are delivered in an operationally reliable condition. Nevertheless, hazards may arise during use.

Failure to observe the information in this operating manual may result in life-threatening injuries!

In addition, the local accident prevention regulations and general safety regulations applicable to the area of use must be observed.

2.2 Proper use

- The power supply unit may only be used in an industrial environment for industrial purposes within the defined power limits specified in the technical data.
- The power supply unit may only be used indoors.

2.3 Improper use

Any use above and beyond the intended use is considered improper or if necessary must be authorised by KOSTAL Industrie Elektrik GmbH & Co. KG.

- Installation in rooms in which substances may form explosive atmospheres/dust atmospheres and use in the medical/pharmaceutical sector are prohibited.
- Installation in rooms or areas that are unprotected and open to the elements, in which the technology is exposed to the prevailing climatic conditions and may fail, is considered improper use.
- The power supply unit is not intended for use by private end users! Use in a residential environment is prohibited without further testing and without the use of appropriate EMC protective measures!
- It must not be used as a safety-related component or to perform safety-related functions.

KOSTAL power supply units are not AS-Interface power supply units!

2.4 Qualification of personnel

Unqualified personnel are unable to recognise risks and are therefore exposed to greater dangers.

⇨ Only assign the activities described in this operating manual to qualified personnel.

⇨ The operator is responsible for ensuring that personnel comply with the locally applicable regulations and rules for safe working with full awareness of hazards.

This operating manual is aimed at the following target groups:

Operating personnel

Operating personnel have been instructed in how to operate and clean KOSTAL power supply units, and follow the safety regulations.

Service personnel

Service personnel have specialised technical training or have completed training provided by the manufacturer and carry out maintenance and repair work.

Electrician

Qualified electricians have specialised technical training and are also able to carry out work on electrical equipment properly on the basis of their knowledge and experience as well as their knowledge of the relevant regulations. They can recognise potential hazards independently and prevent personal injury and damage to property caused by electrical voltage.

All work on the electrical equipment may only be carried out by qualified electricians.

2.5 Hazards

Here you will find information about various types of hazards or damage that may arise in connection with operating the power supply unit.

Personal injury

⇨ Maintenance, installation and repair work on the device may only be carried out by authorised qualified personnel in compliance with the applicable regulations.

Electricity

⇨ Only carry out installation and maintenance work when the device is de-energised. De-energise the power supply unit and secure it from being unintentionally restarted.

Working environment

⇨ Remove unnecessary material and objects from the work area.

Malfunctions during operation

⇨ Check the power supply unit regularly for visible damage.

⇨ If smoke appears, de-energise the power supply unit immediately and secure it from being unintentionally restarted.

⇨ Contact qualified personnel immediately to determine the cause of the fault.

Maintenance

⇨ As this is a maintenance-free product, the power supply unit need only be regularly checked for visible damage.

⇨ Never open the power supply unit!

Unintentional start-up

⇨ Ensure that the power supply unit cannot be switched on unintentionally, especially during installation, maintenance work and in the event of an error.

Use a padlock to secure the power supply unit’s break switch and prevent the unit from being restarted. Remove the key and keep it with you until the maintenance or repair work has been completed.

2.6 Interfaces to other components

When integrating the power supply unit, danger points may arise at interfaces to other components. These danger points do not form part of this operating manual and must be analysed during the development, installation and commissioning of the system.

⇨ Check the entire system for any new danger points that may have arisen.

⇨ Observe the safety regulations of the connected devices, e.g. motors.

2.7 Operating modes / operating phases

Normal operation

Operation when installed in the end customer's premises as a component of a complete system.

Special operation

Special operation covers all operating modes / operating phases that are required to ensure and maintain safe normal operation.

Special operating mode	Comment
Transport/storage	—
Installation/commissioning	In a de-energised state
Cleaning	In a de-energised state
Maintenance/repair	In a de-energised state
Troubleshooting	—
Fault rectification	In a de-energised state
Decommissioning	In a de-energised state
Disposal	—

2.8 Applicable documentation

Observe the instructions in the operating manuals of the connected devices.

3. Product information

3.1 Product description

The KOSTAL power supply unit converts the 3-phase 400 V input AC voltage into 24 V or 48 V DC voltage to supply power to the connected loads:

- KPS 24V – output voltage 24 V DC, output current continuous 40 A
- KPS 48V – output voltage 48 V DC, output current continuous 20 A

Additional distinguishing features are ease of use, minimal configuration ("plug-and-play" design) and simple replacement in the event of a defect.

The built-in DC on/off switch enables the connected loads to be de-energised.

The switch can be secured in the off position to prevent the unit from being unintentionally restarted.

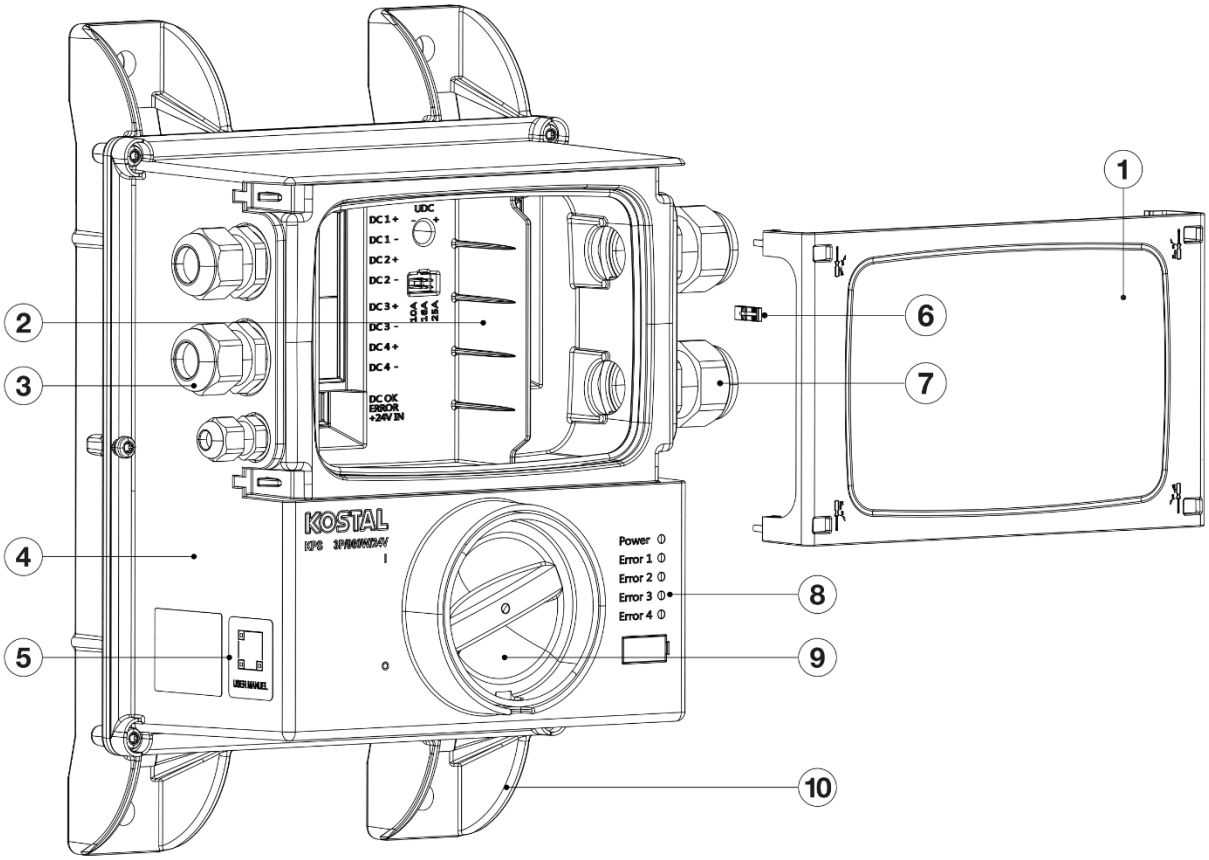
Energy recovery / overvoltage protection / brake chopper

If connected motors are stopped or if their speed is abruptly reduced, for example, the kinetic energy of the accelerated mass is converted into electrical energy. This energy is fed back into the system, where it can either be used by other motors or converted into heat by the brake resistor built into the power supply unit.

The chopper becomes active if the output voltage set via the potentiometer is exceeded by 1 V (KPS 24V) or 2 V (KPS 48V) due to this energy recovery. This prevents excessive voltages within the system.

3.2 Components

Overview (exploded view of KPS)



1	Terminal compartment cover
2	Terminal compartment
3	M20 / M12 cable glands
4	Housing cover
5	Type plate, user manual label
6	Jumper for output current limitation
7	M25 cable glands
8	Status LED
9	DC on/off switch (lockable)
10	Housing base with cooling elements

The terminal compartment cover can be opened using a suitable flat head screwdriver.

DC on/off switch

WARNING

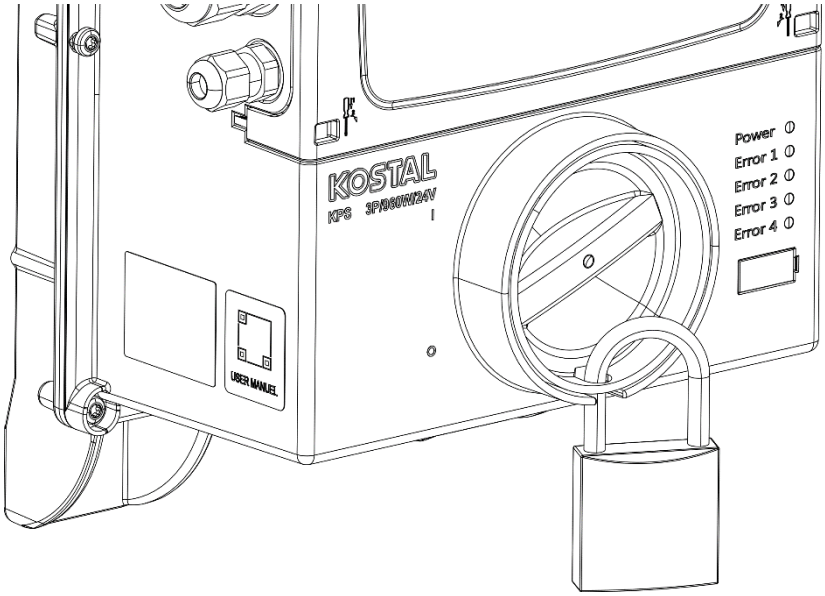
Risk of death due to electrical shock!

The power supply unit's DC on/off switch is not a mains isolating device in accordance with STOP category 0.

The on/off switch only switches off the DC supply voltage of the connected loads.

⇨ Electrical work may only be carried out by a qualified electrician.

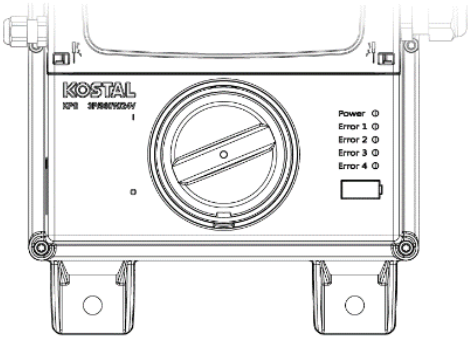
⇨ When working on the 400 V voltage supply: De-energise the system and secure it from being unintentionally restarted.



A contactless switching element is used as the control element.

The break switch can be locked in the off position to prevent the power supply unit from being unintentionally restarted.

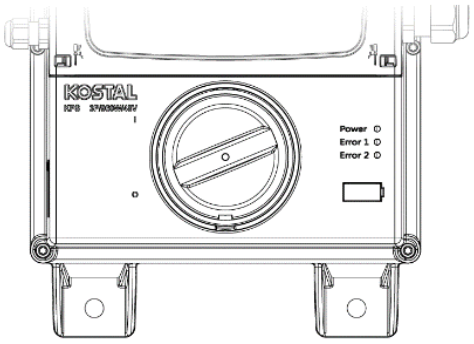
Status LED on KPS 24V



KPS 24V	Power	Error 1	Error 2	Error 3	Error 4
Normal operation	ON	OFF	OFF	OFF	OFF
DC output voltage switched off	1 Hz	OFF	OFF	OFF	OFF
Shutdown due to error condition	Flashes n*-times	ON	ON	ON	ON
Warning (DC output remains active)	Flashes n*-times	OFF	OFF	OFF	OFF
Overcurrent DC 1	Flashes 7-times	ON	OFF	OFF	OFF
Overcurrent DC 2	Flashes 7-times	OFF	ON	OFF	OFF
Overcurrent DC 3	Flashes 7-times	OFF	OFF	ON	OFF
Overcurrent DC 4	Flashes 7-times	OFF	OFF	OFF	ON
Overcurrent system error	Flashes 7-times	ON	ON	ON	ON

* n = see table "Flashing cycle of power LED", below

Status LED on KPS 48V



KPS 48V	Power	Error 1	Error 2
Normal operation	ON	OFF	OFF
DC output voltage switched off	1 Hz	OFF	OFF
Shutdown due to error condition	Flashes n*-times	ON	ON
Warning (DC output remains active)	Flashes n*-times	OFF	OFF
Overcurrent DC 1	Flashes 7-times	ON	OFF
Overcurrent DC 2	Flashes 7-times	OFF	ON
Overcurrent system error	Flashes 7-times	ON	ON

* n = see table "Flashing cycle of power LED", below

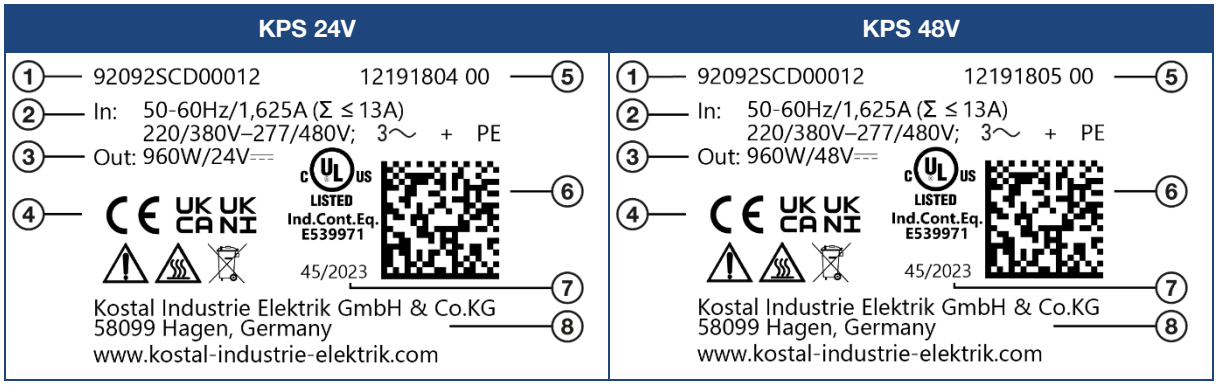
Flashing cycle of power LED

Flashing by power LED: n times	Description
1	Device protection: critical condition (e.g. overcurrent in the power stack)
2	Device protection: rated output exceeded for too long
3	Device protection: overload; 1.5 x rated output exceeded
4	Device protection: excess temperature
5	Failure of a phase detected
6	Device protection: overloading of chopper resistor
7	Overcurrent protection on the output side

Where possible, statuses are reported as warnings. The DC outputs are left active. Critical statuses are reported as errors and lead to the DC outputs being switched off.

3.3 Type plate

The information on the type plate enables the power supply unit to be identified. This is needed to allow the power supply unit to be used as intended.



1	Serial number
2	Input connected loads*
3	Output connected loads
4	CE / UL mark / warning symbols
5	Article number
6	QR code for further information
7	Week / year of production
8	Manufacturer

* Σ ≤13 A – Maximum total current to be expected when the supply line is looped to a maximum of 8 power supply units.

3.4 Technical data

	KPS 24V	KPS 48V
Connected loads	**380**Y/220 V – **480**Y/277 V ±10 %; **3**~+**PE**; 1.625 A (Σ ≤13 A)	
Protection required on the grid side	3 x 16 A	
Leakage current	~1 mA	
Network forms	TT network TN-C-S network	
Grid frequency	50 - 60 Hz, ±6 %	
Maximum inrush current	4.4 A 400 V / 50 Hz	5.3 A 480 V / 60 Hz
Rated output voltage	24V DC	48V DC
Output voltage control range (potentiometer)	24 V - 28 V	48 V - 54 V
Output voltage tolerance	± 0.5 % at no load	
Ripple (peak - peak)	Vpp ≤ 600 mV [1]	Vpp ≤ 400 mV [1]
Rated output current at 380 - 480 V AC	40 A at 24 V DC	20 A at 48 V DC
Rated output	960 W	
Boost mode	1440 W for 4 s	
Chopper resistor power	Continuous power 30 W, peak power 200 W – design with pulse stability	
Feedback protection	up to 35 V	up to 60 V
Efficiency	≥ 92%	≥ 92%
Overvoltage category	III	
Protection class	IP54	
Pollution degree	2	
Ambient temperature during operation	-30 °C to +40 °C [2]	
Ambient temperature during transport and storage	-40 °C to +85 °C	
Installation height above sea level	Max. 1000 m [3]	

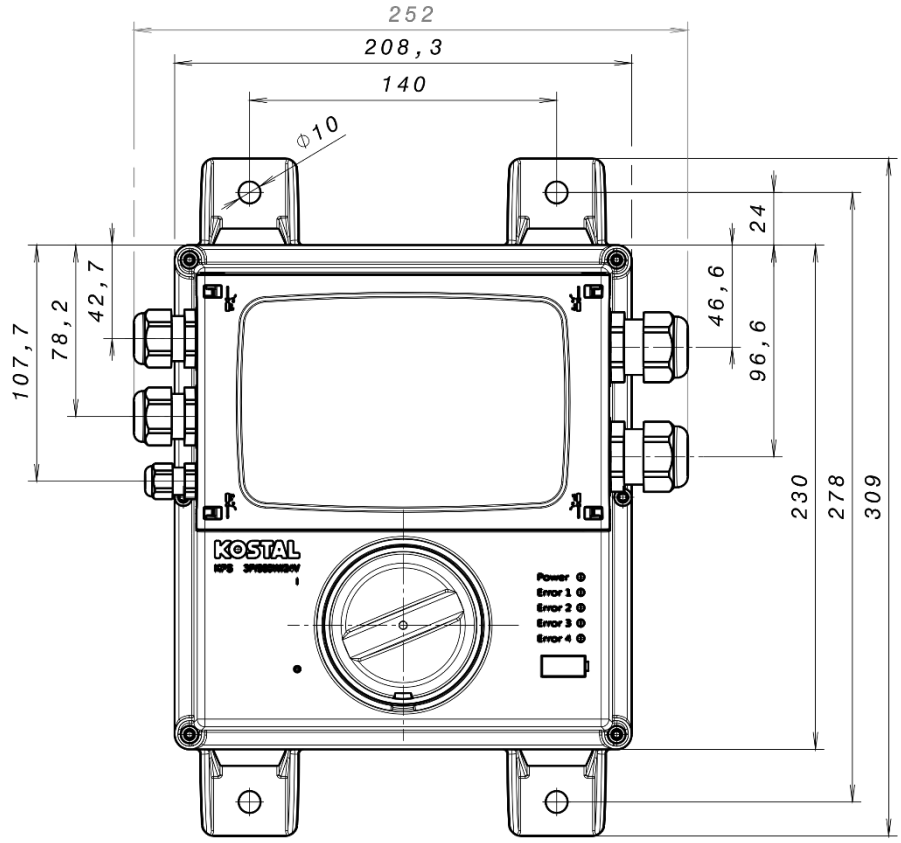
All data apply to a temperature of 20 °C.

[1] Value according to internal ripple measurement specification based on IEEE 1515-2000 and JEITA-RC9131A standards.

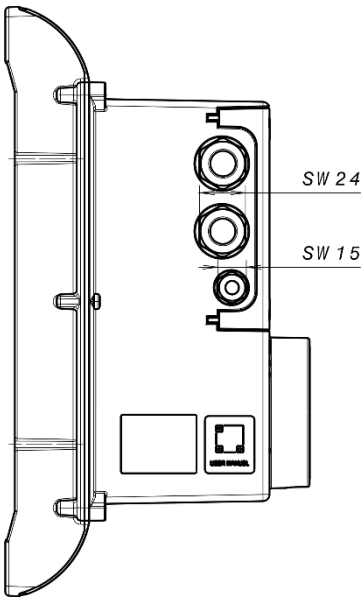
[2] At temperatures below -20 °C, the cable bushings used can only withstand static loads.

[3] A significant derating is to be expected from 1000 m.

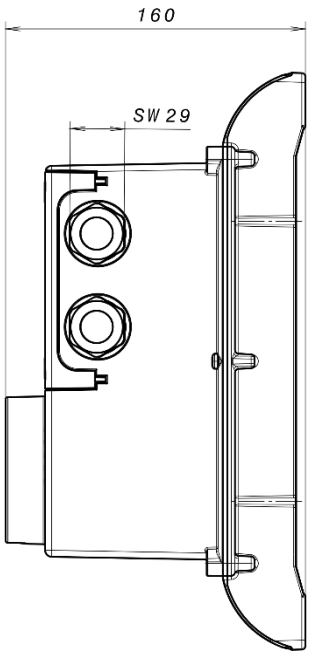
3.5 Dimensions



Front view



Left side



Right side

3.6 Further information

Further information about the product can be accessed via the QR code, which can also be found on the type plate on the power supply unit:

4. Transport and storage

4.1 Transport

WARNING

Risk of death due to damage to the housing!

⇨ Check each power supply unit for visible damage after transport.

⇨ In the event of transport damage, inform the haulage firm or KOSTAL immediately so as not to lose any claims for compensation.

⇨ If damage is detected, take photos of damaged parts.

CAUTION

Risk of injury due to improper transport!

⇨ Transport work may only be carried out by authorised qualified personnel.

The following instructions must be observed:

⇨ Do not stack pallets on top of each other.

⇨ Before transporting, check that the KOSTAL power supply units are correctly secured.

⇨ Avoid heavy impacts during transport.

⇨ Do not expose the power supply units to large temperature fluctuations as this may lead to the formation of condensation.

4.2 Storage

CAUTION

Risk of injury due to improper storage!

⇨ Ensure safe storage of the power supply units.

5. Installation

5.1 Warnings relating to installation

WARNING

Risk of death due to damage to the housing!

⇨ Check each power supply unit for visible damage before installation.

⇨ Never install damaged power supply units!

⇨ In the event of damage, inform the supplier or KOSTAL immediately.

NOTE

Improper handling when installing the KOSTAL power supply unit may lead to damage to property or shorten the service life of the power supply unit.

⇨ To prevent damage to the interior of the power supply unit, do not drop the unit or use it improperly.

⇨ Do not install the power supply unit above heat sources and ensure that the natural air circulation around the power supply unit is maintained.

⇨ Do not drill any additional mounting holes in the housing and do not enlarge existing holes.

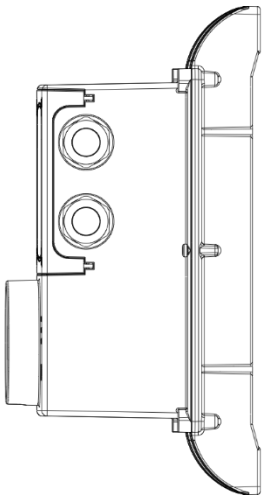
5.2 Installation position

To minimise line losses, install the power supply unit close to the loads.

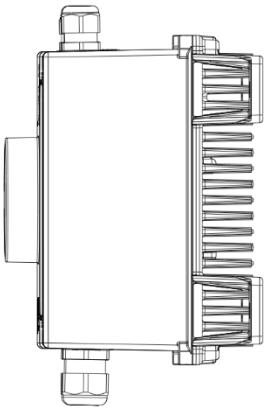
Install the power supply unit in the preferred installation position (see the following illustration).

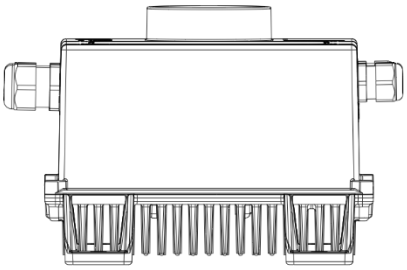
Derating is to be expected with the alternative installation positions.

The following installation positions are permitted:



Preferred installation position





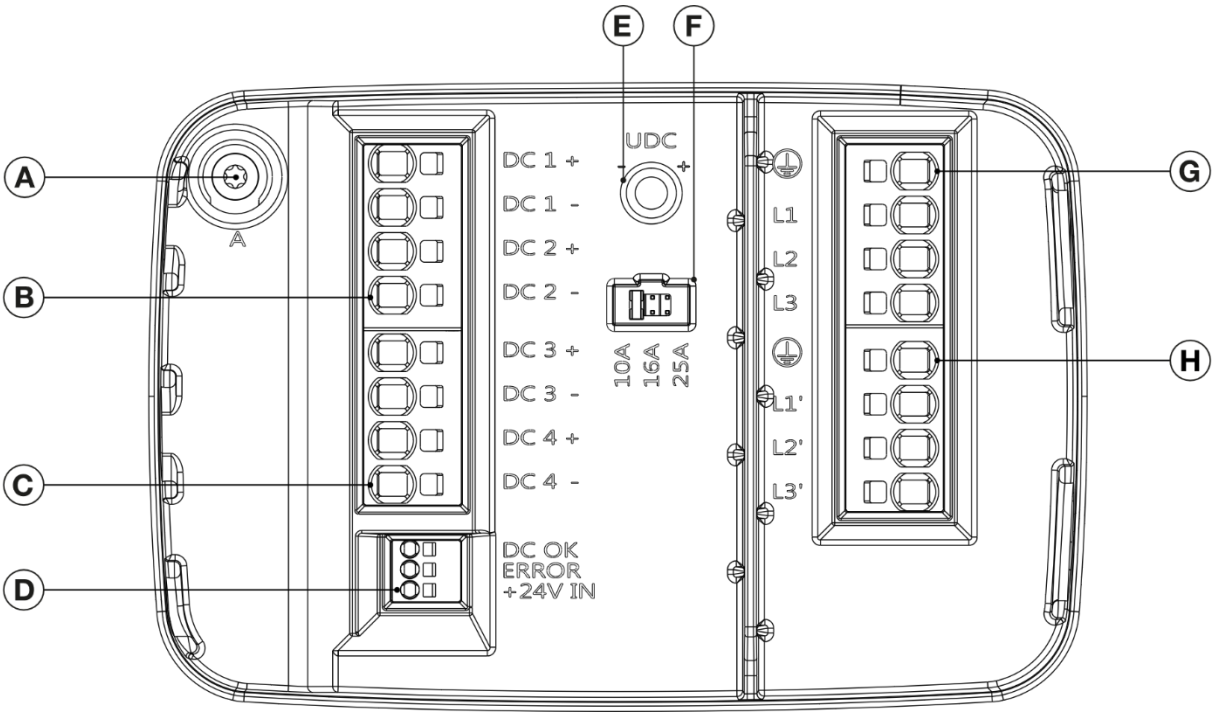
Alternative installation positions (derating possible / not UL-tested)

⇨ Install the KOSTAL power supply unit on a flat surface.

⇨ Ensure that the screws cannot come loose as a result of vibrations or jolts and that no deformation has occurred in the housing.

5.3 Connections and settings

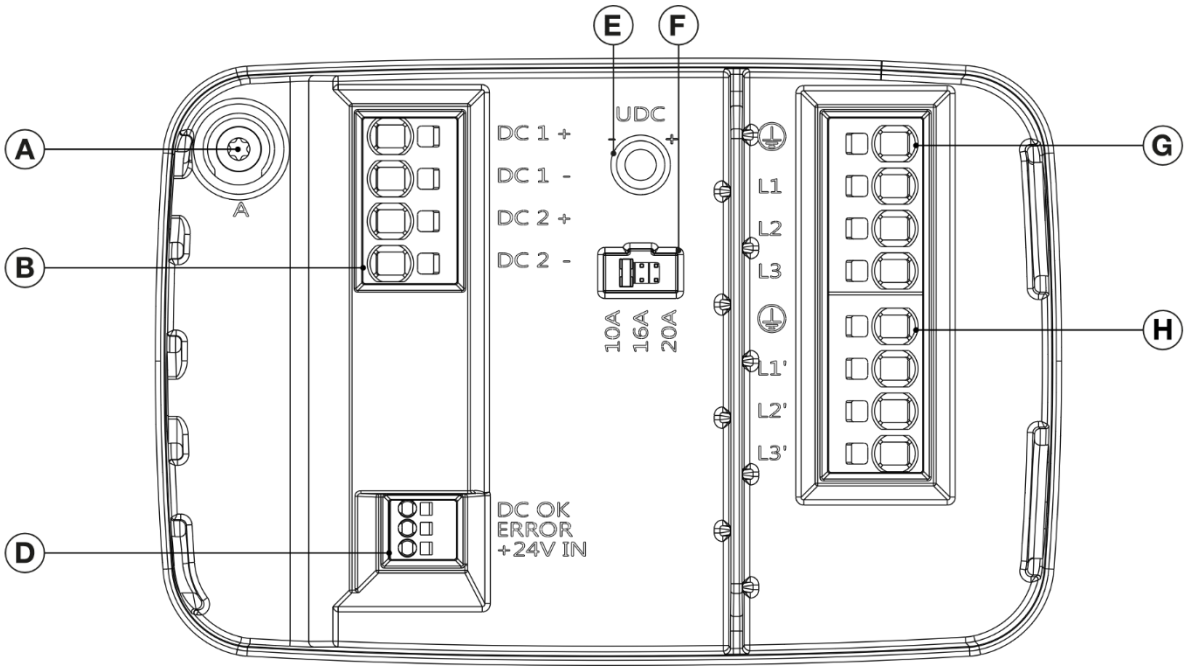
KPS 24V



A	Connection to earth
B	Connection block 1: 24 V DC (max. 6 mm²)
C	Connection block 2: 24 V DC (max. 6 mm²)
D	Signal connection (max. 1.5 mm²)
E	UDC setting potentiometer
F	Jumper setting for DC line protection
G	Connection block 3: 400 V AC (max. 6 mm²)
H	Connection block 4: 400 V AC (max. 6 mm²)

If the jumper is not inserted, an error message is displayed (overcurrent protection).

KPS 48V



A	Connection to earth
B	Connection block 1: 48 V DC (max. 6 mm²)
D	Signal connection (max. 1.5 mm²)
E	UDC setting potentiometer
F	Jumper setting for DC line protection
G	Connection block 3: 400 V AC (max. 6 mm²)
H	Connection block 4: 400 V AC (max. 6 mm²)

If the jumper is not inserted, an error message is displayed (overcurrent protection).

(A) Connection to earth

The screw labelled "A" establishes the PELV protective conductor connection for the DC voltage supply.

Screw "A" must be removed for the insulation test (secondary side to PE). Replace the screw after this test.

(B) Connection block 1: 24/48 V DC

	KPS 24V	KPS 48V
DC 1 +	+ 24 V DC	+ 48 V DC
DC 1 –	0 V	0 V
DC 2 +	+ 24 V DC	+ 48 V DC
DC 2 –	0 V	0 V

(C) Connection block 2: 24 V DC (only KPS 24V)

	KPS 24V
DC 3 +	+ 24 V DC
DC 3 –	0 V
DC 4 +	+ 24 V DC
DC 4 –	0 V

In order not to overload the output terminals, we recommend distributing the connected devices symmetrically.

NOTE

Loss of line protection due to incorrect connection

⇨ The outputs must not be connected in series or in parallel!

(D) Signal connection (transistor outputs)

Signal outputs for readiness of the DC voltage supply and a collective error signal.

	DC OK	ERROR
DC off; no error; (no supply if applicable)	L	H
DC on; no error	H	H
DC on; warning (e.g. mains phase failure)	H	L
DC off; error (e.g. overcurrent, overload)	L	L

The ERROR output is protected against wire breakage.
The 24 V control voltage must be routed separately.

(E) UDC setting potentiometer

Fine adjustment of the DC output voltage

	KPS 24V	KPS 48V
Setting range	24 V – 28 V DC	48 V – 54 V DC

NOTE

Destruction of the built-in potentiometer!

⇨ Do not turn beyond the potentiometer's limit position (not an endless potentiometer!).

(F) Jumper setting for DC line protection

The DC line protection is set according to the connected loads.

	KPS 24V	KPS 48V
Selection	10 A* / 16 A / 25 A	10 A* / 16 A / 20 A

* Factory setting

NOTE

Overloading of the connected cables!

⇨ Observe the correct setting of the DC line protection.

The DC line protection has a common shutdown element for all outputs. If one single output experiences overcurrent or overload, all outputs are shut down.

(G) Connection block 3: 400 V AC

Input terminals for the 400 V voltage supply.

A four-core connection cable without a neutral conductor is sufficient for connecting the KOSTAL power supply units.

(H) Connection block 4: 400 V AC

Output terminals for looping through the 400 V voltage supply to another KOSTAL power supply unit.

A divider is installed in the terminal compartment to prevent incorrect routing between the DC and AC voltage ranges.

The cable glands of the supply line and the cable for looping through the supply line are type M25 cable glands.

- Manufacturer / type: Jacob GmbH – Perfect 50.625 PA/SW UL-File: QCRV2.E140310

The cable glands of the cables to the loads are type M20 cable glands.

- Manufacturer / type: Jacob GmbH – Perfect 50.620 PA/SW UL-File: QCRV2.E140310

The cable gland for the signal line is a type M12 cable gland.

- Manufacturer / type: Jacob GmbH – Perfect 50.612 PA/SW UL-File: QCRV2.E140310

When supplied, all glands are sealed with a round plug.

5.4 Electrical installation

WARNING

Risk of death due to electrical shock!

- ⇨ Check each power supply unit for visible damage prior to electrical installation.
- ⇨ Never install damaged power supply units!
- ⇨ In the event of damage, inform the supplier or KOSTAL immediately.
- ⇨ Electrical installation work may only be carried out by a qualified electrician.
- ⇨ Before installing, removing or connecting the KOSTAL power supply unit, de-energise the entire system and secure it from being unintentionally restarted.
- ⇨ Only switch on the operating voltage when all cables are connected and the power supply unit cover is fitted.

NOTE

Damage to the power supply unit!

- ⇨ For the supply line to the power supply unit, only use cables of adequate dimensions for the specific operating conditions, particularly with regard to cross-section and insulation.
- ⇨ As the temperature in the terminal compartment may exceed 60 °C at nominal load, make sure that the connection cables used are approved for temperatures > 80 °C.
- ⇨ Ensure that no dust or dirt deposits can enter the interior of the housing when opening it.
- ⇨ Ensure that all connected components are correctly earthed.

NOTE

Proper installation!

- ⇨ Before you can start connecting the cables, the device must be secured to the intended installation surface!
- ⇨ The cables must be laid and secured in such a way that the cable glands or the electrical connection points are not subjected to mechanical stress!
- ⇨ Use stranded conductors. These can be clamped directly without the use of core end sleeves.

Application information

The following information is intended to assist the operator in using the KOSTAL power supply unit. The information does not claim to be exhaustive. Checks must be undertaken in each individual case to determine the extent to which the specific usage conditions allow this information to be applied. The applicable safety and installation regulations at the operating site take precedence.

Connection and protection on the grid side

The KOSTAL power supply unit does not contain any internal device fuses. Due to the operating principle of the power supply unit, overloads on the load side are not transferred to the grid connection. Protective devices on the grid side would therefore be ineffective.

The dimensioning of the fuse(s) on the grid side can focus on line protection.

To ensure the full performance of the power supply unit, the use of phase monitoring or interlinked fuses is recommended on the grid side.

NOTE

Proper installation!

⇨ Prolonged or permanent operation of the power supply unit with only two phases is not permitted!

Connection and protection on the load side

The power supply unit is equipped with electronic DC line protection.

According to the jumper setting for output current limitation (see 5.3 Connections and settings), output currents and the total current are evaluated and a shutdown is triggered if they are exceeded.

The total output of 1 kW or an overload of 1.5 kW for 4 seconds is also monitored independently.

The shutdown interrupts the flow of energy.

The shutdown is monitored in the built-in controller. If the energy flow on the secondary side is not stopped within the expected response time, a forced shutdown is triggered. This ensures that the defined response time of the safety function is never exceeded.

By switching the DC on/off switch off and on again, the error is reset.

Systems with multiple KOSTAL power supply units

If a system requires a higher connected load than can be provided by one KOSTAL power supply unit, the system must be divided into supply areas. Each of these areas must be supplied separately from a single power supply unit.

Series or parallel connection of the load connections of two or more power supply units is not permitted!

To simplify installation, the grid connection can be looped through. Each KOSTAL power supply unit has an additional terminal slot and an additional M20 cable gland for connecting a further power supply unit. During project planning, the corresponding requirements regarding the load capacity of the supply line, fuse protection and switch requirements must be observed.

Electrical connection

- ⇨ Replace the round plugs in the cable glands to be used with suitable sealing inserts.
- ⇨ Feed the cable through the gland closest to the required terminal.
- ⇨ Ensure that all cable glands are in place and fitted with suitable seals.
- ⇨ Strip the cable as appropriate and strip the wires to a sufficient length.
- ⇨ Connect the cables according to the terminal diagram (see 5.3 Connections and settings).

A clockwise rotating field is not required for the KOSTAL power supply unit's supply line. To simplify identification of the connections, we nevertheless recommend using the corresponding wire colour.

NOTE

Do not open the housing!

- ⇨ The housing must not be opened (except for the terminal compartment). Opening the housing invalidates the test certificate and thus the warranty from KOSTAL!
- ⇨ The supply cable may loop through a maximum of eight power supply units!

6. Commissioning and operation

6.1 Commissioning

Testing before initial commissioning

⇨ Ensure that the power supply unit has been correctly secured to the place of use and that all screws have been properly tightened.

⇨ Ensure that no additional hazard zones are created by the interfaces to other components.

⇨ Ensure that the wiring complies with the specification and legal requirements.

⇨ Check all protective devices.

⇨ Carry out insulation tests.

NOTE

Damage to the power supply unit!

⇨ As the power supply unit has varistors to the housing, an insulation test (primary side to PE) may be carried out in the system at a maximum of 500 V!

The PELV switching status must be cancelled during an insulation test. The operator is responsible for ensuring that the correct switching status is restored afterwards (see 5.3 Connections and settings).

⇨ If necessary, carry out further tests after installation before switching on for the first time in accordance with the regulations applicable at the place of use.

6.2 Operation

WARNING

Risk of crushing and danger from rotating parts due to motors starting in an uncontrolled manner!

⇨ Before switching on the operating voltage, ensure that there is no-one in the system's hazard zones.

CAUTION

Risk of burns!

Depending on the load and ambient temperature, temperatures > 65 °C are possible on the power supply unit's cooling elements.

Check before each start-up

⇨ Check power supply unit for visible damage

WARNING

Risk of death due to damage to the housing!

⇨ Switch off damaged power supply units immediately and secure against being restarted!

⇨ Inform the responsible supervisor and a qualified electrician.

⇨ Check all protective devices.

Observe the ambient conditions during operation (see 3.4 Technical data).

6.3 What to do in the event of an accident or fault

⇨ Stop the system immediately, de-energise it and secure it from being unintentionally restarted.

⇨ In the event of an accident: Provide first aid and call the emergency services.

⇨ Inform the responsible supervisor.

⇨ Have the fault rectified by qualified personnel.

⇨ Only put the system back into operation once approved by qualified personnel.

7. Maintenance and cleaning

WARNING

Risk of injury due to improper handling!

- ⇨ Maintenance and cleaning work may only be carried out by authorised and trained (qualified) personnel.
- ⇨ Only carry out maintenance and cleaning work when the device is de-energised. De-energise the power supply unit and secure it from being unintentionally restarted.
- ⇨ Put up signs indicating that maintenance or cleaning work is being carried out.

CAUTION

Risk of burns!

Depending on the load and ambient temperature, temperatures > 65 °C are possible on the power supply unit's cooling elements.

- ⇨ Allow the device to cool down.

7.1 Maintenance

The power supply unit itself is maintenance-free.

- ⇨ Regularly check connections and fastenings (visual inspection).
- ⇨ Check the general integrity of all components (visual inspection).

An insulation or DC line protection test can be carried out if required.

If need be, the housing may have to be cleaned.

7.2 Cleaning

- ⇨ Remove foreign matter and coarse dirt from the surface of the housing.
- ⇨ Remove light soiling with a dry cloth.
- ⇨ Do not use tools with sharp edges to clean the power supply unit.

8. Assistance in the event of faults

WARNING

Risk of injury due to improper handling!

- ⇨ Troubleshooting may only be carried out by authorised qualified personnel.
- ⇨ Only carry out troubleshooting when the device is de-energised.
- ⇨ De-energise the power supply unit and secure it from being unintentionally restarted.

CAUTION

Risk of burns!

Depending on the load and ambient temperature, temperatures > 65 °C are possible on the power supply unit's cooling elements.

- ⇨ Allow the device to cool down.

8.1 Troubleshooting

- ⇨ For a description of the status LED, see 3.2 Components, "Status LED on KPS 24V" and "Status LED on KPS 48V" sections.
- ⇨ See also 5.3 Connections and settings, table "(D) Signal connection (transistor outputs)".

9. Decommissioning and disposal

DANGER

Risk of death due to electrical shock and discharge

⇨ De-energise device and secure against being restarted.

CAUTION

Risk of burns!

Depending on the load and ambient temperature, temperatures > 65 °C are possible on the power supply unit's cooling elements.

⇨ Allow the device to cool down.

9.1 Decommissioning

To dismantle the power supply unit, proceed as follows:

⇨ De-energise the AC and DC sides of the power supply unit.

⇨ Remove terminal compartment cover.

⇨ Loosen terminals and cable glands.

⇨ Remove all DC cables, AC cables and any other cables if present.

⇨ Mount terminal compartment cover.

⇨ Remove lock screw.

⇨ Lift power supply unit off the wall.

✓ The power supply unit is dismantled.

9.2 Disposal

Electronic equipment labelled with a dustbin with a line through it may not be disposed of with household waste. This equipment can be handed in to waste collection points free of charge.

Find out about the local requirements for the separate collection of electrical and electronic equipment in your country.

10. Appendix

10.1 Declaration of conformity

INDUSTRIE ELEKTRIK

KOSTAL

EU-Konformitätserklärung

Dokument-Nr./ Monat. Jahr: DOC03317621-0001 / 02.2024

Für das nachfolgend bezeichnete Erzeugnis

Produktbezeichnung:	KPS 3P/960W/24V; KPS 3P/960W/48V
Modellnummer Kostal:	12191804; 1219805

wird hiermit erklärt, dass es die **grundlegenden Anforderungen** erfüllt, die in den nachfolgend bezeichneten Harmonisierungsrechtsvorschriften festgelegt sind:

RICHTLINIE 2014/35/EU – **Niederspannungsrichtlinie** (ABl. L 96 vom 29.03.2014, S. 357)
RICHTLINIE 2014/30/EU – **EMV-Richtlinie** (ABl. L 96 vom 29.03.2014, S. 79)
RICHTLINIE 2011/65/EU – **RoHS-Richtlinie** (ABl. L 174 vom 01.07.2011, S. 88)

Weitere Angaben über die Einhaltung dieser Richtlinien enthält die **Anlage 1**.

Diese Erklärung gilt für alle Exemplare, die nach den entsprechenden Fertigungszeichnungen - die Bestandteil der technischen Unterlagen sind - hergestellt werden. Die Erklärung verliert ihre Gültigkeit, wenn an dem Gerät eine Änderung vorgenommen wird.

Diese Erklärung wird verantwortlich für den Hersteller oder seinen Bevollmächtigten

NAME:	KOSTAL Industrie Elektrik GmbH & Co. KG
Anschrift:	An der Bellmerei 10, D- 58513 Lüdenscheid

abgegeben durch

Name, Vorname:	Tigges, Martin	Schiedewitz, Martin
Funktion:	Leiter Business Unit Electronics	Bereichsleiter Qualitätsmanagement

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung in Bezug auf die Erfüllung der grundlegenden Anforderungen und die Anfertigung der technischen Unterlagen trägt der Hersteller (bzw. Installationsbetrieb):

NAME:	KOSTAL Industrie Elektrik GmbH & Co. KG
Anschrift:	An der Bellmerei 10, D- 58513 Lüdenscheid

Hagen / 29.02.2024 i.V. Tigges i.V. Schiedewitz

Ort/Datum Rechtsgültige Unterschrift

Die Anlagen sind Bestandteil dieser Erklärung.

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Harmonisierungsrechtsvorschriften, beinhaltet jedoch keine Zusicherung von Eigenschaften.

EU-Konformitätserklärung (gemäß EN ISO/IEC 17050-1)

INDUSTRIE ELEKTRIK

KOSTAL

Anlage 1 zur EU-Konformitätserklärung

Dokument-Nr./ Monat. Jahr: DOC03317621-0001 / 02.2024

Für das nachfolgend bezeichnete Erzeugnis

Produktbezeichnung:	KPS 3P/960W/24V; KPS 3P/960W/48V
Modellnummer Kostal:	12191804; 1219805

Angabe der einschlägigen **harmonisierten Normen**, die zugrunde gelegt wurden, oder Angabe der Spezifikationen, für die die Konformität erklärt wird:

FUNDSTELLE	AUSGABEDATUM	TITEL
Harmonisierte Normen zur Niederspannungsrichtlinie:		
EN IEC 61010-2-201	2018	Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte — Teil 2-201: Besondere Anforderungen für Steuer- und Regelgeräte
Harmonisierte Normen zur EMV-Richtlinie:		
EN 61326-1	2013	Elektrische Mess-, Steuer-, Regel- und Laborgeräte — EMV-Anforderungen — Teil 1: Allgemeine Anforderungen
Harmonisierte Normen zur RoHS-Richtlinie:		
EN IEC 63000	2018	Technische Dokumentation zur Beurteilung von Elektro-und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe (IEC 63000:2016)
Weitere angewandte technische Spezifikationen (nicht im EU-Amtsblatt veröffentlicht):		

Weitere Angaben über die Einhaltung obiger Fundstellen enthält die beigefügte die Konformitätsaussage unterstützende Begleitdokumentation.

EU-Konformitätserklärung (gemäß EN ISO/IEC 17050-1)

Legal notice

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